

SOME COCCIDAE FROM THE PHILIPPINE ISLANDS.

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So far as I am aware, only one Coccid has hitherto been recorded from the Philippine Islands, namely, *Chrysomphalus rossi*, from Manila (Proc. Acad. Nat. Sci. Phila., 1899, p. 274). The collection now reported on was obtained by Professor C. H. Tyler Townsend, who in former years discovered so many new Coccidæ in Mexico. Being quite familiar with the group, he knew what to look for, and as I expected, the results are highly satisfactory. While the number of new species is considerable, there are no new genera; but practically everything came from cultivated plants, and it may well be that an examination of the recesses of the native forests will yield more highly characteristic endemic forms.

Monophlebulus townsendi, n. sp.

♀ Grey, flattened, 9^{mm} long, 7½ broad, about 3 high, when dry; the true color is very dark reddish, the grey appearance resulting from the mealy covering; there is a well-defined dorsal area, about 4^{mm} broad, marked in the abdominal region by strong transverse ridges representing the segments; anal orifice plainly visible with a lens, on the dorsal surface about 2½^{mm} from hind end; it is small and round, about 168μ diameter, hairless.

Legs and antennæ black; legs very stout; middle of abdominal region deeply concave beneath, the sides (broad marginal area) densely covered with white cottony tomentum; mouth parts visible in the form of a projecting dark cone; anterior margin of body emarginate and from the emargination arise some long coarse blackish bristles. Antennæ about as long as femur and trochanter of middle leg, i. e. about 1½^{mm}; six joints, 3 to 6 about equal, each about 300μ long; 2 shorter and considerably stouter; first joint broader than long; the joints have coarse pale

yellowish bristles, very numerous on the last two. Eggs, raspberry color, about 765μ long.

Batangas, Sept. 20. Peculiar for the six-jointed antennæ in the adult. The only other known species of the genus is Australian.

Icerya candida, n. sp.

♀. With ovisac about 7^{mm} . long (perhaps longer when quite perfect), ovisac not grooved; all the secretion pure white, densely covering the body; there are some white glassy filaments, but they are not numerous; antennæ dark red-brown, 11 jointed, about 900μ long; joint 4 shortest, being much broader than long; 11 long and slender and much the longest; 2 and 3 about equal and much longer than any of the joints between 3 and 11; 8 to 10 longer than broad; 1 very broad. Legs ordinary, dark reddish, anterior femora stout.

Young with six (three pairs) of extremely long caudal bristles, longer than the body; long lateral hairs not differentiated into two series, but about equally variable in length all round body; antennal club stout, with long bristles, one of them about as long as whole antenna. Apex of abdomen not emarginate.

Manila, June 4, on a cultivated tree with large oblong-ovate rough leaves. The adult has the last antennal joint obviously longer than the two before it combined and it is much longer than Douglas figures for *I. ægyptiacum*. The larva belongs to the *I. purchasi*—*seychellarum*—*ægyptiacum* group; the lateral hairs are very much longer than those shown in Douglas's figure of *ægyptiacum*.

Icerya seychellarum (Westwood).

Lucban, Tayabas, Luzon, March 30, 1904, on cultivated rose; Manila, June 1, on cultivated guava. A parasite was bred from the Manila specimens and sent to Dr. Ashmead, who will describe it as *Parasaphes townsendi*, n. sp.

Pseudococcus lilacinus, n. sp.

♀. Globose, densely covered with white meal, when mounted subglobular, about 1800μ long; after boiling in caustic potash, the pigment in the body is lilac; legs fairly short, anterior leg with femur and trochanter 200μ long, tibia 100, tarsus 65; hind leg,

femur and trochanter 245, tibia 150, tarsus 70, width of femur 65μ ; claw stout, simple. Antennæ 8-jointed, length of joints in μ (1.) 25-55, (2.) 32-52, (3.) 37-50, (4.) 20-45, (5.) 25-42, (6.) 27-30, (7.) 30, (8.) 80. In one instance joint 3 measured 73, evidently being combined with 4. Larva in body of female about 375μ long. Lucban, Tayabas, April 10, 1904, on cultivated orange.

I supposed at first that this must be *P. filamentosus*, but that is quite different by the blue-green pigment after boiling and the antennæ are also different. On account of the pigment, it is equally excluded from *P. albizziæ*. By the purplish pigment and general appearance it resembles *P. quaintancii* (Tinsley); it is also rather near *P. texensis* (Tinsley) and *P. comstocki* (Kuwana). The antennæ are very variable, but the series of measurements 25, 45, 45, 22, 25, 30, 30, 80, expresses what I take to be the more normal lengths of the joints.

Pseudococcus tayabanus, n. sp.

♀. Covered with mealy secretion, distinctly segmented, looking (when dry) like minute specimens of commercial cochineal; when mounted oval, about 1500μ long; after boiling, the body is seen to contain much dull crimson pigment, especially in the embryonic young; eyes well-developed; anal ring with six hairs, and placed in a wide squared incision; lateral margins of segments projecting, so that the margin is strongly undulated, the projecting points bear stout spines, about 12μ long; skin greatly crowded with round glands; labium long and narrow, about 150μ long and 70 broad; legs stout, length of tibia about 125μ (counting from middle to middle), tarsus 75; claw stout, simple; antennæ 8-jointed, joints measuring in μ (1.) 50, (2.) 50-62, (3.) 50-52, (4.) 25-27, (5.) 33-40, (6.) 40-45, (7.) 37-40, (8.) 87. The smaller measurements (50) for two appears to be normal.

Larva with longitudinal rows of bristles (not spines), the middle row double; six stout hairs on anal ring; claw long, simple; antennæ 6-jointed, joints measuring, (1.) 20, (2.) 22, (3.) 17, (4.) 17, (5.) 22, (6.) 52-55. Joint 8 bears three whorls of hairs, and ends in a stout blunt cone.

Lucban, Tayabas, April 7 and April 20, 1904, on cultivated cacao.

A peculiar species, in many respects like *P. texensis* (Tinsley). The antennæ are not unlike those of *P. comstocki* (Kuwana), but that has joints 4 and 5 not very different in length.

Pseudococcus virgatus (Cockerell), variety.

♀. Secretion full of glassy filaments; anterior leg with femur and trochanter 292μ long, tibia 212, tarsus 89; claw rather long, simple; antennæ 8-jointed, 8 with three whorls of hairs; joints measuring (1.) 50, (2.) 63-65, (3.) 70-72, (4.) 37-42, (5.) 40-45, (6.) 45-47, (7.) 45-47, (8.) 100.

Lucban, Tayabas, April 20, 1904, on cultivated croton.

Typical *virgatus*, from Jamaica and Ceylon, is larger, with the third antennal joint considerably longer. The antennæ of the Philippine insect practically agree with those of *P. kraunhiæ* (Kuwana), and I should not be surprised if the two proved identical, though Kuwana does not allude to any glassy filaments. Kuwana says that *kraunhiæ* has the tibia three times as long as the tarsus, but his figure contradicts this. Our insect also shows some resemblance to *P. magnolicida*. Whether or not it is identical with anything described, I think it is undoubtedly a variety of *P. virgatus*.

Saissetia nigra (Nietner).

Manila, May 19, on cassava run wild.

Saissetia oleæ (Bernard).

Lucban, April 11, 1904, on cultivated plant called "rosal" or "campopot."

Saissetia hemisphærica (Targioni-Tozzetti).

Lucban, April 11, 1904, on cultivated sago palm, and on two undetermined cultivated plants.

Coccus longulus (Douglas).

Lucban, April 20, 1904, on cultivated "macetas," a croton with oak-like white-spotted leaves.

Coccus diversipes, n. sp.

♀. Scale light reddish-brown, quite flat, broad-oval, the anterior end narrowest; length $2\frac{1}{4}$ - $2\frac{2}{3}$ ^{mm}, breadth about 2; surface

marked with many large irregularly shaped polygonal areas, about 60 to 150 μ diameter, in each of which is a smaller area of the same general form, and within this sometimes a smaller and occasionally a smaller within that; these areas are marked merely by contour-lines, which show little marginal cracks; they are not destroyed by boiling in liquor potanæ, but they become wholly invisible when the insect is mounted in balsam; the regions between these areas show numerous small gland-spots, which appear blackish. Anal plates long and narrow, 187 μ long, and together 130 wide, posterior lateral side 87 long, anterior lateral side 150 long, tip of plates to hind end of body about 750 μ .

Anterior legs ordinary, femur and trochanter 145 μ long, tibia 80, tarsus 50, the femur not especially slender, its diameter about 45 μ . Middle and hind legs remarkably slender and elongated, with very large coxæ; measurements in μ :—

	Femur and Trochanter.	Tibia.	Tarsus.	Width of Femur.
Middle legs.....	250	105	42	4 ¹
Hind legs.....	265			4 ¹

Antennæ 6-jointed, joints measuring (1.) 30, (2.) 37, (3.) 97, (4.) 27-30, (5.) 25-27, (6.) 55. Joint 3 is slender and smooth, with a whorl of bristles 80-84 μ from base; 6 is slender, with several long bristles. Marginal hairs strongly fimbriate or branched, about 20 μ apart.

Lucena, Tayabas, April 24, 1904, on cultivated fern "parasite."

Very close to *C. acuminatus* ("Signoret") of Green, but not identical; also close to *C. incisus* (King), but that has 8-jointed antennæ. The antennæ of *C. diversipes* are almost exactly like those of *C. rhizophora* (Cockerell), and are very similar to those of *Eucalymnatus gracilis* (Hempel), but these insects are otherwise different.

Pulvinaria polygonata, n. sp.

♀. Light brown; ovisac pure white, broad and fluffy, irregular in form; mounted female a little over 3^{mm} long and 2 broad; skin with an irregularly polygonal structure like some *Saissetia*, only the walls of the spaces are perfectly hyaline and colorless, the spaces are about 25 μ diameter; mouth-parts small; marginal spines about 30 μ apart, long, stout, more or less branched at end, but not greatly broadened; stigmatal spines ordinary; anal plates

together forming nearly a square, their length and breadth (of the two together) each about 137μ . Anterior leg measuring, femur and trochanter 215, tibia 150, tarsus (without claw) 75; claws hooked, their digitules fully twice their length, with very large knobs. Antennæ 8-jointed, 5 with a very long bristle; joints measuring, (1.) 50, (2.) 52, (3.) 75, (4.) 57, (5.) 50, (6.) 30, (7.) 30, (8.) 50.

Manila, June 3, on leaves of a cultivated shade-tree, accompanied by a species of *Aleyrodes*.

P. tessellata, Green, has the dermal markings, but it has a bright green fluted ovisac; *P. aurantii*, Cockerell, has similar antennæ, but quite different marginal spines, etc.; *P. eugeniæ*, Hempel, has also similar antennæ, but a different ovisac; *P. tecta*, Maskell, has the dermal markings, but the marginal spines are simple; *P. simplex*, King, has polygonal dermal markings, but otherwise is different.

Pulvinaria tyleri, n. sp.

♀. Smallish, light brown, with a loose, shapeless fluffy white ovisac; mounted female about 1865μ long (full of eggs, which are very large, 570μ long); stigmatal spines in threes, the long ones stout and 60μ long, the short about 15; marginal spines stout, not close together, simple or very slightly bifid at end; legs ordinary, measurements of anterior legs; femur and trochanter 220, tibia 168, tarsus (without claw) 92. Antennæ 8-jointed; measurements of joints:—(1.) 40, (2.) 62, (3.) 70, (4.) 40, (5.) 40, (6.) 27, (7.) 22, (8.) 50.

Batangas, April 7, 1905, on "cadena de amor," crowded on the twigs. Quite distinct from *P. psidii* and *P. aurantii*.

Pulvinaria psidii philippina, n. subsp.

♀. Scales and ovisacs matted together in great confusion; marginal hairs about 50μ apart, broad and flattened at end, the margin of the flattened part slightly fimbriated; tibia $225-262\mu$ long, tarsus 110-117; claw digitules long, with large round knobs, 12μ diameter; bristles of anal ring stout, 200μ long; anal plates ordinary, length 140, anterior lateral margin 87, posterior lateral margin 107. Antennæ 6-jointed, joints measuring, (1.) 50, (2.) 50-57, (3.) 100-105, (4.) 50, (5.) 67, (6.) 95. Joints 2 and 5 each with a very long bristle.

Lucena, Tayabas, April 20, 1904, on a cultivated *Ficus*.

The long tibia, long third antennal joint, marginal hairs, long bristles on joints 2 and 5 of antennæ, etc., all show this insect to be very close to *P. ficus*, Hempel, and *P. psidii*, Maskell. The six-jointed antennæ are distinctive, but may not be constant. It is evidently reasonable to treat the insect as a subspecies of *psidii*, and so far as I can make out *P. ficus* should stand as *P. psidii ficus*.

Aspidiotus simillimus translucens, Cockerell.

Lucban, Tayabas, April 19, 1904, on cocoanut seedling. Length of female 750μ or rather more; anterior lateral glands 7, posterior laterals 4-5, in a group.

Aspidiotus lataniæ, Signoret.

Lucban, Tayabas, April 6, 1904, on cabbage.

Aspidiotus tayabannus, n. sp.

♀. Scales crowded on bark, not distinctly separable, flat, dark ferruginous, exuvixæ marked by a distinct dot and ring in grey or yellowish-white, but on rubbing, the second skin appears, bright orange-ferruginous or orange-chestnut; there is a thin whitish ventral film.

Female insect light yellow (after boiling), reniform; no circumgenital glands; dorsal pores few and small; genital orifice about 30μ anterior to anal orifice, its margin thickened; anal orifice about 7μ long, oval, distant about 30μ from tips of median lobes, two pairs of lobes, close together, the median lobes large and elongated, their inner sides practically contiguous, the apex rounded, the outer margin with a strong notch; second lobes of the same general shape, but very much smaller, more pointed, with the notch stronger; spines rather large; a short distance beyond the second lobe the margin presents two little pointed projections, and beyond that come three large broad strap-shaped squames, their ends or sides with a few linear processes; then two more small pointed projections, and beyond that a very fine serrulation of the margin. In the interval between the first and second lobes are two long club-shaped glands or "paraphyses,"

the inner about twice as long as the outer, its rounded end extending beyond the level of the anal orifice.

Lucban, Tayabas, April 11, 1904, on cultivated plant called "rosal" or "campopot," with *Saissetia oleæ*.

Allied to *A. moorei*, Green, and by the club-shaped organs suggesting *A. quadriclavatus*, Green, and *Pseudaonidia clavigera*, Cockerell. The lobes are curiously similar in form to those of *A. forbesi*, Johnson.

Pseudaonidia trilobitiformis (Green).

Manila, May 7, 1904, on *Artocarpus*.

Chrysomphalus rossi (Maskell).

Lucban, Tayabas, March 30 and April 19, 1904, on cultivated sago palm; Lucban, March 30, 1904, on "Nanganongcaong," cultivated.

Chrysomphalus aonidum (Linné).

Manila, June 5, on cultivated banana; Manila, May 7, 1904, on *Artocarpus*; Manila, June 5, on large spreading palm, cultivated, and May 19, on native palm (like *Oreodoxa*), cultivated.

Chrysomphalus aurantii (Maskell).

Manila, May 7, 1904, on *Artocarpus*.

Parlatoria proteus (Curtis).

Manila, June 5, on *Eugenia malaccensis*, cultivated.

Parlatoria pergandii (Comstock).

Manila, May 19, on aloe-like plant, cultivated. The scales look like *proteus*, but the fourth lobe of *pergandii* is very distinct.

Aulacaspis rosæ (Bouché).

Lucban, Tayabas, on rose, cultivated, March 30, 1904. A variety with the second skin black, tipped with light reddish.

Phenacaspis eugeniæ (Maskell).

Manila, June 5, on a large spreading palm, cultivated. This seems to be *eugeniæ*, but it will be more critically examined by Professor Cooley, who is revising the genus.

Hemichionaspis townsendi, n. sp.

♀. Scale light greyish or yellowish, exactly the color of the back on which it rests, the exuviae a little yellower; shape pyriform, rather broad, varying to nearly circular.

♂. Scale white, bluntly tricarinate, the exuvia very pale yellowish.

♀. Color after boiling light yellowish, with some blue pigment at the cephalic end; length of mounted example 672μ , breadth 600, the insect therefore shorter than usual; sides of segments bulging, forming on each side about four large rounded prominences; eggs in body of female (well-developed with eyes showing) 155μ long; five groups of circumgenital glands, median about 16, anterior laterals about 19 or 20, posterior laterals about 25; anal orifice round, about 12μ diameter, and 112 from tips of median lobes; dorsal glands not very numerous; median lobes contiguous, low and broad (about 12μ long, the two together 22 broad) with four crenulations produced by three notches, the first two being very deep and strong; second lobes quite rudimentary, not or hardly rising above general margin; first spine-like squame small, but the others (three single ones at rather long intervals, and then a pair) very large and long.

Lucban, Tayabas, on bark of *Gossypium*, April 12. The male scales are in groups and conspicuous, but the female scales are so inconspicuous that I very nearly overlooked them. The notches of the median lobes are considerably deeper than in any species figured on Cooley's Pl. IX. The rudimentary second lobes afford a character to distinguish the species from *H. theæ* and *aspidistræ*.

Lepidosaphes cocculi (Green).

Manila, June 5, on large spreading cultivated palm. Probably some forms from elsewhere, found on palms and recorded as *L. gloveri*, may have been this.

Lepidosaphes rubrovittatus, n. sp.

♀. Scales broader than *gloveri*, but narrower than *ulmi* or *beckii*, and of a peculiar greenish-yellow or yellowish-green color; the exuviae dull orange, with a dark red longitudinal stripe down the middle of both skins. Circumgenital glands close together,

the groups forming a sort of broad V, exactly as in *L. serrifrons*; median group of 3, anterior laterals 7 to 8, posterior laterals 4; dorsal glands conspicuous; anal orifice small, about 82μ from hind end; three segments before the terminal area produced laterally, and bearing spines; anterior end with the skin finely striate, but not in the least provided with the spines or projections of *serrifrons*; lobes, etc., similar to those of *serrifrons*; third lobe (second lobule of second) more or less rudimentary, so that it is not readily noticed; median lobes striate, slightly notched on each side, and very slightly inclined to be crenulate; squames all spine-like and simple; marginal oval fusiform gland-orifices very distinct, as in *ulmi*, etc.

Manila, June 5, on cultivated *Eugenia malaccensis*, with *Parlatoria*.

This insect belongs to a group consisting of *L. gloveri*, (Packard), *L. pallida*, (Green), *L. pallida maskelli*, (Cockerell) and itself. It is nearest to *maskelli*, and is perhaps only a variety or race of it, *maskelli* itself being probably a species distinct from *pallida*.